TORQ Analysis of Machinists to Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic

INPUT SECTION:

Transfer	Title	O*NET	Filters		
From Title:	Machinists	51-4041.00	Abilities:	Importance LeveL: 50	Weight: 1
To Title:	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4032.00	Skills:	Importance LeveL: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

OUTPUT SECTION:

Grand TORQ:	83

Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	87	Level	84	Level	77

Gaps To Narrow if Possible

Ability	Level	Gap	Impt
Finger Dexterity	50	11	56
Trunk Strength	42	5	53
Perceptual Speed	44	5	50

Upgrade These Skills

Skill	Level	Gap	Impt
Instructing	59	14	69

Knowledge to Add

Knowledge	Level	Gap	Impt
No Knowledge Upgrades Required!			

LEVEL and IMPT (IMPORTANCE) refer to the Target Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic. GAP refers to level difference between Machinists and Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic.

ASK ANALYSIS

Ability Level Comparison - Abilities with importance scores over 50

Description	Machinists	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Importance
Arm-Hand Steadiness	55	44	65
Manual Dexterity	55	44	62
Control Precision	57	51	62
Near Vision	57	51	62
Oral Comprehension	57	46	59
Written Comprehension	53	46	59
Static Strength	48	48	59
Problem Sensitivity	55	41	56

Finger Dexterity	39	50	56
Multilimb Coordination	51	42	56
Oral Expression	59	46	53
Inductive Reasoning	53	41	53
Information Ordering	67	42	53
Visualization	60	42	53
Trunk Strength	37	42	53
Deductive Reasoning	57	42	50
Perceptual Speed	39	44	50
Rate Control	41	39	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Machinists	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Importance
Mathematics	64	51	75
Operation Monitoring	78	66	74
Reading Comprehension	61	48	72
Quality Control Analysis	69	62	71
Active Listening	53	48	70
Equipment Maintenance	69	61	70
Instructing	45	59	69

Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Machinists	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Importance
Mechanical	70	66	79
Mathematics	66	59	70

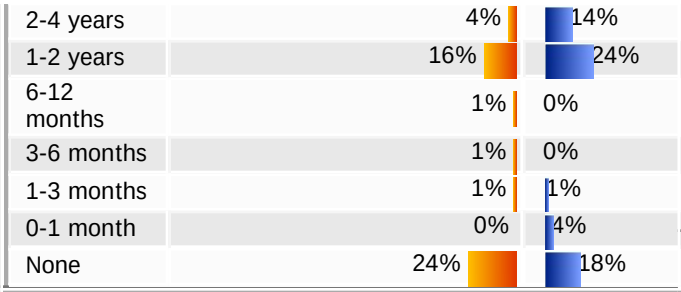
Experience & Education Comparison

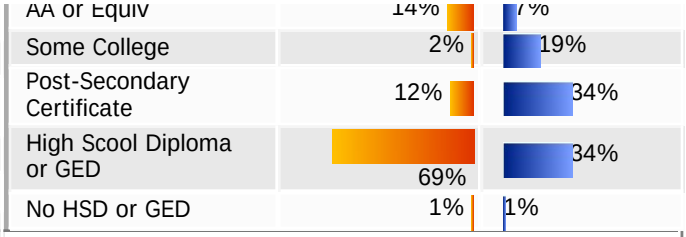
Related Work Experience Comparison

Description	Machinists	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic
10+ years	0%	7%
8-10 years	0%	1%
6-8 years	2%	7%
4-6 years	46%	18%

Required Education Level Comparison

Description	Machinists	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic
Doctoral	0%	0%
Professional Degree	0%	0%
Post-Masters Cert	0%	0%
Master's Degree	0%	0%
Post-Bachelor Cert	0%	0%
Bachelors	0%	3%





Machinists	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic
Most Common Educational/Training Requirement:	
Long-term on-the-job training	Moderate-term on-the-job training
Job Zone Comparison	
3 - Job Zone Three: Medium Preparation Needed	2 - Job Zone Two: Some Preparation Needed
Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.	Some previous work-related skill, knowledge, or experience may be helpful in these occupations, but usually is not needed. For example, a teller might benefit from experience working directly with the public, but an inexperienced person could still learn to be a teller with little difficulty.
Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.	These occupations usually require a high school diploma and may require some vocational training or job-related course work. In some cases, an associate's or bachelor's degree could be needed.
Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.	Employees in these occupations need anywhere from a few months to one year of working with experienced employees.

Tasks

Machinists

Core Tasks

Generalized Work Activities:

- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- Monitor Processes, Materials, or Surroundings - Monitoring and reviewing information from materials, events, or the environment, to detect or assess problems.

Specific Tasks

Occupation Specific Tasks:

Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Core Tasks

Generalized Work Activities:

- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.

Specific Tasks

- Advise clients about the materials being used for finished products.
- Align and secure holding fixtures, cutting tools, attachments, accessories, and materials onto machines.
- Calculate dimensions and tolerances using knowledge of mathematics and instruments such as micrometers and vernier calipers.
- Check work pieces to ensure that they are properly lubricated and cooled.
- Clean and lubricate machines, tools, and equipment to remove grease, rust, stains, and foreign matter.
- Confer with engineering, supervisory, and manufacturing personnel to exchange technical information.
- Confer with numerical control programmers to check and ensure that new programs or machinery will function properly, and that output will meet specifications.
- Design fixtures, tooling, and experimental parts to meet special engineering needs.
- Dismantle machines or equipment, using hand tools and power tools, to examine parts for defects and replace defective parts where needed.
- Establish work procedures for fabricating new structural products, using a variety of metalworking machines.
- Evaluate experimental procedures, and recommend changes or modifications for improved efficiency and adaptability to setup and production.
- Fit and assemble parts to make or repair machine tools.
- Install experimental parts and assemblies such as hydraulic systems, electrical wiring, lubricants, and batteries into machines and mechanisms.
- Install repaired parts into equipment, or install new equipment.
- Lay out, measure, and mark metal stock to display placement of cuts.
- Machine parts to specifications using machine tools such as lathes, milling machines, shapers, or grinders.
- Maintain industrial machines, applying knowledge of mechanics, shop mathematics, metal properties, layout, and machining procedures.
- Measure, examine, and test completed units to detect defects and ensure conformance to specifications, using precision instruments such as micrometers.
- Monitor the feed and speed of machines during the machining process.
- Observe and listen to operating machines or equipment to diagnose machine malfunctions and to determine need for adjustments or repairs.
- Operate equipment to verify operational

Occupation Specific Tasks:

- Change worn cutting tools, using wrenches.
- Establish zero reference points on workpieces, such as at the intersections of two edges or over hole locations.
- Install tools in spindles.
- Lay out reference lines and machining locations on work, using layout tools, and applying knowledge of shop math and layout techniques.
- Lift workpieces onto work tables either manually or with hoists, or direct crane operators to lift and position workpieces.
- Move machine controls to lower tools to workpieces and to engage automatic feeds.
- Observe drilling or boring machine operations to detect any problems.
- Operate single- or multiple-spindle drill presses to bore holes so that machining operations can be performed on metal or plastic workpieces.
- Operate tracing attachments to duplicate contours from templates or models.
- Perform minor assembly, such as fastening parts with nuts, bolts, and screws, using power tools and hand tools.
- Position and secure workpieces on tables, using bolts, jigs, clamps, shims, or other holding devices.
- Select and set cutting speeds, feed rates, depths of cuts, and cutting tools according to machining instructions or knowledge of metal properties.
- Sharpen cutting tools, using bench grinders.
- Study machining instructions, job orders, and blueprints to determine dimensional and finish specifications, sequences of operations, setups, and tooling requirements.
- Turn valves and direct flow of coolants or cutting oil over cutting areas.
- Verify conformance of machined work to specifications, using measuring instruments such as calipers, micrometers, and fixed and telescoping gauges.
- Verify that workpiece reference lines are parallel to the axis of table rotation, using dial indicators mounted in spindles.

Detailed Tasks

Detailed Work Activities:

- adjust production equipment/machinery setup
- examine products or work to verify conformance to specifications
- install equipment or attachments on machinery or related structures

efficiency.

- Position and fasten work pieces.
- Prepare working sketches for the illustration of product appearance.
- Program computers and electronic instruments such as numerically controlled machine tools.
- Select the appropriate tools, machines, and materials to be used in preparation of machinery work.
- Set controls to regulate machining, or enter commands to retrieve, input, or edit computerized machine control media.
- Set up and operate metalworking, brazing, heat-treating, welding, and cutting equipment.
- Set up, adjust, and operate all of the basic machine tools and many specialized or advanced variation tools to perform precision machining operations.
- Study sample parts, blueprints, drawings, and engineering information to determine methods and sequences of operations needed to fabricate products, and determine product dimensions and tolerances.
- Support metalworking projects from planning and fabrication through assembly, inspection, and testing, using knowledge of machine functions, metal properties and mathematics.
- Test experimental models under simulated operating conditions for such purposes as development, standardization, and feasibility of design.

Detailed Tasks

Detailed Work Activities:

- adjust production equipment/machinery setup
- advise clients or customers
- confer with engineering, technical or manufacturing personnel
- design tools or mechanical devices
- determine tasks needed to complete machined products
- examine products or work to verify conformance to specifications
- fabricate, assemble, or disassemble manufactured products by hand
- follow statistical process control procedures
- identify base metals for welding
- install equipment or attachments on machinery or related structures
- lay out machining, welding or precision assembly projects
- load or unload material or workpiece into machinery
- maintain or repair industrial or related equipment/machinery
- lay out machining, welding or precision assembly projects
- load or unload material or workpiece into machinery
- measure, weigh, or count products or materials
- move or fit heavy objects
- operate hoist, winch, or hydraulic boom
- operate metal or plastic fabricating equipment/machinery
- read blueprints
- read production layouts
- read technical drawings
- read work order, instructions, formulas, or processing charts
- recognize characteristics of metals
- set up computer numerical control machines
- set up production equipment or machinery
- signal directions or warnings to coworkers
- understand machine setup instructions
- understand technical operating, service or repair manuals
- use hand or power tools
- use precision measuring tools or equipment

Technology - Examples

- maintain welding machines or equipment
- monitor production machinery/equipment operation to detect problems
- move or fit heavy objects
- operate metal or plastic fabricating equipment/machinery
- perform safety inspections in manufacturing or industrial setting
- program computer numerical controlled machines
- read blueprints
- read specifications
- read technical drawings
- recognize characteristics of alloys
- recognize characteristics of metals
- set up and operate variety of machine tools
- set up computer numerical control machines
- set up production equipment or machinery
- solve machine tool problems
- understand machine setup instructions
- understand technical operating, service or repair manuals
- use arc welding equipment
- use drafting or mechanical drawing techniques
- use hand or power tools
- use knowledge of fire suppression methods in industrial emergencies
- use knowledge of metric system
- use machining practices
- use non-destructive test equipment
- use precision measuring tools or equipment
- use robotics systems technology
- use technical information in manufacturing or industrial activities
- use x-ray or magnetic inspection techniques
- weld together metal parts, components, or structures

Technology - Examples

Analytical or scientific software

- Armchair Machinist software
- CNC Consulting Machinists' Calculator
- EditCNC software
- Kentech Kipware Software
- Kentech Trig Kalculator

Computer aided design CAD software

- Autodesk AutoCAD software

- Computer aided design CAD software

Computer aided manufacturing CAM software

- CNC Mastercam
- CNC TurboCAD/CAM
- Computer aided manufacturing CAM software
- JETCAM software

Electronic mail software

- Microsoft Outlook

Facilities management software

- Faster Fleet Management software

Industrial control software

- Pro CNC software

Office suite software

- Microsoft Office

Project management software

- Kentech Kipware PLN
- Kentech Kipware QTE
- Kentech Kipware TRK

Spreadsheet software

- Microsoft Excel

Word processing software

- Microsoft Word

Tools - Examples

- Adjustable wrenches
- Anvils
- Grinding wheel arbors
- Bandsaws
- Grinding dogs
- Milling vises
- Chamfer tools
- Jointers
- Torches
- Boring bars
- Broachers
- Calipers

- Chucks
- Cold chisels
- Combination wrenches
- Deburring tools
- Desktop computers
- Center drills
- Side cutting pliers
- Angled feeler gauges
- Files
- Forklifts
- Marking blocks
- Brazing equipment
- Angle plates
- Shapers
- Crankshaft grinders
- Ball peen hammers
- Clamps
- Gauges
- Hex keys
- Edge finders
- Hydraulic presses
- Ladders
- Laser printers
- Breaker lathes
- Spirit levels
- Channel lock pliers
- Magnetic retrievers
- Microscopes
- Rubber mallets
- Metal inert gas MIG welders
- Prick punches
- Inside micrometers

- 3-axis computerized numerical control CNC machines
- Milling machines
- Needlenose pliers
- Personal computers
- Personal digital assistants PDA
- Pipe wrenches
- Screw pitch gauges
- Planers
- Plasma welders
- Platforms
- Sandblasters
- Buffers
- Chippers
- Combination drills
- Cylindrical grinders
- Sanders
- Cold saws
- Vernier bevel protractors
- Pry bars
- Putty knives
- Ratchet sets
- Reamers
- Resurfacing machines
- Welding lenses
- Hacksaws
- Phillips head screwdrivers
- Scribers
- Cylinder honers
- Metal shears
- Shims
- Machine shop rigging equipment
- Socket sets

- Soldering equipment
- Machinists' squares
- Steel rules
- Swaging equipment
- Taps
- Thread gauges
- Threading machines
- Pipe threaders
- Aviation snips
- Tongs
- Bending machines
- Tungsten inert gas TIG welding equipment
- Radial drills
- Utility knives
- Steel wedges
- Arc welders
- Welding shields
- Metal spray equipment
- Cranes
- Arbor presses

Labor Market Comparison

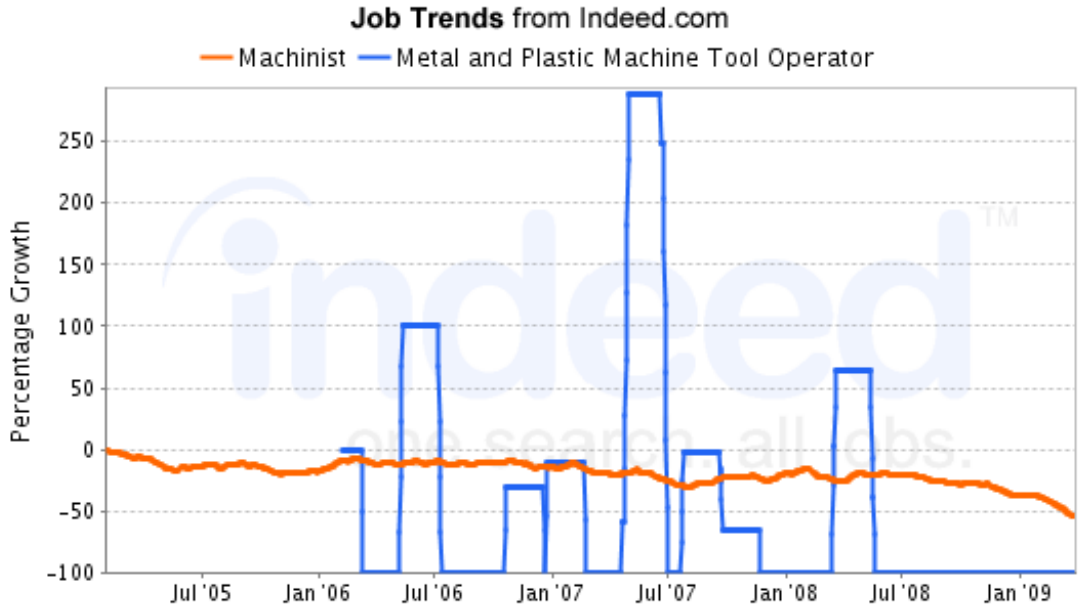
Description	Machinists	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Difference
Median Wage	$ 41,560	$ 33,030	$(8,530)
10th Percentile Wage	$ 26,250	$ 24,670	$(1,580)
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	$ 48,290	$ 39,630	$(8,660)
90th Percentile Wage	$ 56,030	$ 44,350	$(11,680)
Mean Wage	$ 41,780	$ 33,380	$(8,400)
Total Employment - 2007	1,860	100	-1,760
Employment Base - 2006	1,832	102	-1,730

Projected Employment - 2016	1,905	80	-1,825
Projected Job Growth - 2006-2016	4.0 %	-21.6 %	-25.5 %
Projected Annual Openings - 2006-2016	35	2	-33

National Job Posting Trends

Trend for Machinists

Trend for Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic



Data from Indeed

Recommended Programs

Machinist/Machine Technologist

Machine Tool Technology/Machinist. A program that prepares individuals to apply technical knowledge and skills to plan, manufacture, assemble, test, and repair parts, mechanisms, machines, and structures in which materials are cast, formed, shaped, molded, heat treated, cut, twisted, pressed, fused, stamped or worked.

Institution	Address	City	URL
Central Maine Community College	1250 Turner St	Auburn	www.cmcc.edu
Central Maine Community College	1250 Turner St	Auburn	www.cmcc.edu
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu
Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu

Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu
Northern Maine Community College	33 Edgemont Dr	Presque Isle	www.nmcc.edu
Southern Maine Community College	2 Fort Road	South Portland	www.smccME.edu

Machine Shop Assistant

Machine Shop Technology/Assistant. A program that prepares individuals to apply technical knowledge and skills to fabricate and modify metal parts in support of other manufacturing, repair or design activities, or as an independent business.

No schools available for the program

Maine Statewide Promotion Opportunities for Machinists

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings
51-4041.00	Machinists	100	3	1,860	$41,560.00	$0.00	4%	35
51-4111.00	Tool and Die Makers	85	3	160	$51,670.00	$10,110.00	-11%	2
51-4192.00	Lay-Out Workers, Metal and Plastic	82	2	180	$43,870.00	$2,310.00	-24%	3
51-4012.00	Numerical Tool and Process Control Programmers	79	3	60	$43,530.00	$1,970.00	21%	2
49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment	78	3	440	$49,450.00	$7,890.00	-19%	15
17-3023.01	Electronics Engineering Technicians	76	3	430	$45,180.00	$3,620.00	-20%	9
17-3023.03	Electrical Engineering Technicians	75	3	430	$45,180.00	$3,620.00	-20%	9
49-2095.00	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	75	5	20	$60,790.00	$19,230.00	5%	1
49-9012.00	Control and Valve Installers and Repairers, Except Mechanical Door	74	3	170	$47,860.00	$6,300.00	-9%	3
49-9061.00	Camera and Photographic Equipment Repairers	73	3	0	$44,660.00	$3,100.00	0%	0
49-3011.00	Aircraft Mechanics and Service Technicians	73	3	210	$44,280.00	$2,720.00	-2%	2

51-8013.00	Power Plant Operators	73	3	480	$50,240.00	$8,680.00	10%	21
47-4021.00	Elevator Installers and Repairers	72	4	0	$50,960.00	$9,400.00	0%	0
17-3027.00	Mechanical Engineering Technicians	72	3	130	$44,890.00	$3,330.00	2%	3
53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	72	3	60	$42,890.00	$1,330.00	5%	2

Top Industries for Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Industry	NAICS	% in Industry	Employment	Projected Employment	% Change
Motor vehicle parts manufacturing	336300	16.96%	7,240	5,187	-28.35%
Machine shops	332710	9.73%	4,152	3,091	-25.55%
Other fabricated metal product manufacturing	332900	8.04%	3,432	2,737	-20.26%
Turned product and screw, nut, and bolt manufacturing	332720	5.63%	2,403	1,567	-34.77%
Aerospace product and parts manufacturing	336400	5.37%	2,291	2,100	-8.34%
Other general purpose machinery manufacturing	333900	4.94%	2,109	1,714	-18.75%
Metalworking machinery manufacturing	333500	4.67%	1,993	1,468	-26.32%
Architectural and structural metals manufacturing	332300	4.63%	1,975	1,898	-3.88%
Engine, turbine, and power transmission equipment manufacturing	333600	3.30%	1,408	1,064	-24.46%
Agriculture, construction, and mining machinery manufacturing	333100	3.18%	1,357	1,140	-15.97%
Foundries	331500	3.07%	1,309	854	-34.74%
Plastics product manufacturing	326100	2.39%	1,018	972	-4.60%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	2.29%	977	809	-17.21%
Other electrical equipment and component manufacturing	335900	2.18%	930	776	-16.60%
Electrical equipment manufacturing	335300	2.10%	897	686	-23.53%

Top Industries for Machinists

Industry	NAICS	% in Industry	Employment	Projected Employment	% Change
Machine shops	332710	18.50%	73,341	63,702	-13.14%

Metalworking machinery manufacturing	333500	6.55%	25,986	22,339	-14.03%
Motor vehicle parts manufacturing	336300	6.18%	24,524	20,501	-16.40%
Employment services	561300	6.04%	23,956	31,835	32.89%
Aerospace product and parts manufacturing	336400	4.53%	17,976	19,223	6.94%
Other general purpose machinery manufacturing	333900	4.05%	16,052	15,215	-5.21%
Other fabricated metal product manufacturing	332900	3.34%	13,262	12,338	-6.96%
Turned product and screw, nut, and bolt manufacturing	332720	2.38%	9,427	7,174	-23.90%
Industrial machinery manufacturing	333200	2.04%	8,073	6,944	-13.98%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	1.97%	7,831	7,872	0.53%
Plastics product manufacturing	326100	1.87%	7,414	8,252	11.30%
Engine, turbine, and power transmission equipment manufacturing	333600	1.70%	6,751	5,949	-11.87%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	1.55%	6,143	6,826	11.11%
Architectural and structural metals manufacturing	332300	1.55%	6,163	6,912	12.14%
Self-employed workers, primary job	000601	1.47%	5,836	6,528	11.86%

